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STAC6

Applied Motion Products



High performance AC Input stepper drives with advanced features & control options.

- ✓ Advanced Current Control
- ✓ Anti-Resonance
- ✓ Torque Ripple Smoothing
- ✓ Microstep Emulation

Specifications

POWER SUPPLY:

STAC6	94-135 VAC
STAC6-220	94-265 VAC

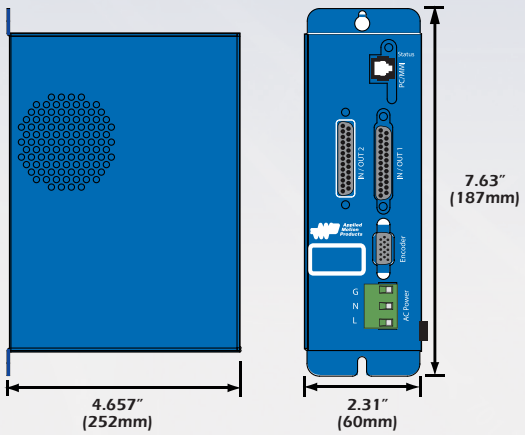
OUTPUT CURRENT:

STAC6	0.5 - 6.0A Peak
STAC6-220	0.5 - 3.2A Peak

PROTECTION:

- Over-Voltage
- Under voltage
- Over-Temp
- External Output Shorts
- Regeneration

Dimensions



Models

S

- Pulse & Direction
- CW/CCW Pulse
- A/B Quadrature
- Analog Velocity (Oscillator) mode
- Host commands (SCL compatible)
- SiNet Hub compatible
- *ST Configurator™* software for setup

Q

- Stand-alone Opperation
- *Q Programmer™* for programming
- Conditional Processing
- Math Functions
- Multi-tasking
- Register Manipulation
- Encoder Following
- Third HMI compatibility

Si

- *Si Programmer™* with built-in Configurator
- Point-and-click indexing software
- Friendly GUI
- I/O and motion programming
- MMI-01 compatibility

C

- CANopen protocols DS301 and DSP402
- Profile Position, Profile Velocity, and Homing modes
- Up to 127 axis per channel
- Execute stored Q programs

STAC6 technical specs.

POWER AMPLIFIER SECTION

AMPLIFIER TYPE	MOSFET , Dual H-Bridge, 4 Quadrant	
CURRENT CONTROL	4 state PWM at 20 Khz	
OUTPUT CURRENT	STAC6	0.5— 6.0 in 0.01 amp increments (6A peak of sine)
	STAC6-220	0.5— 3.2 in 0.01 amp increments (3.2A peak of sine)
POWER SUPPLY	STAC6	Line operated nominal 120 VAC, 50/60 Hz
	STAC6-220	Line operated nominal 220 VAC, 50/60 Hz
AC INPUT VOLTAGE	STAC6	94—135VAC, 50/60Hz
	STAC6-220	94—265VAC, 50/60Hz
PROTECTION	Over-voltage, under-voltage, over-temp, external output shorts (phase-to-phase, phase-to-ground), internal amplifier shorts	
IDLE CURRENT REDUCTION	Reduction to any integer percent of full-current after delay selectable in milliseconds.	
MOTOR REGENERATION	Built in regeneration circuit - 25 watts max.	

CONTROLLER SECTION

NON-VOLATILE STORAGE	Configurations are saved in FLASH memory on board the DSP.
STEP AND DIRECTION INPUTS	Optically Isolated: 5 Volt. Minimum pulse width = 200 ns. Maximum pulse frequency = 2 MHz
RESOLUTION	Software selectable from 200 to 51200 steps/rev in increments of 2 steps/rev
ANTI-RESONANCE	Raises the system damping ratio to eliminate midrange instability and allow stable operation throughout the speed range and improves settling time.
TORQUE SMOOTHING	Allows for fine adjustment of phase current waveform harmonic content to reduce low-speed torque ripple in the range 0.25 — 1.5 rps.
AUTO SETUP	Measures motor parameters and configures motor current control and anti-resonance gain settings.
SELF TEST	Checks internal & external power supply voltages, diagnoses open motor phases.
MICROSTEP EMULATION	Performs low resolution stepping by synthesizing fine microsteps from coarse steps.
COMMAND SIGNAL SMOOTHING	Software configurable filtering reduces jerk and excitation of extraneous system resonances (step & direction mode only).
ENCODER OPTION	Employs encoder (hi or low resolution) to provide failsafe stall detect and perform stall prevention and position maintenance. Differential line receivers suitable for 500 kHz or greater. Minimum encoder resolution is 1000 lines.
INTERFACE	RS-232 and RS-485 , CANopen standard on STAC6-C models.
AMBIENT TEMPERATURE	0 to 55 °C (32- 158 °F)
HUMIDITY	90% non-condensing

INPUTS AND OUTPUTS

IN / OUT 1 connector - All Drives S, SE, Q, QE, Si, C

7 Inputs

X1, X2	Optically Isolated, Differential, 5 Volt. Minimum pulse width = 250ns. Maximum pulse, frequency = 2 MHz Function: Step & Direction, Encoder Following, Sensor, Home or Branch Select
X3	Optically isolated, 12 - 24V, sourcing or sinking. Function: Motor Enable, Sensor, Home or Branch Select
X4	Optically isolated, 12 - 24V, sourcing or sinking. Function: Alarm Reset, Sensor, Home or Branch Select
X5	Optically isolated, 12 - 24V. Function. Function; general Purpose Input.
X6,X7	Optically isolated, 12 - 24V. Function: CW & CCW Limits, Sensor, Home or Branch Select

3 Outputs

Y1	Optical darlington, 30V, 100mA max, NPN/sinking, shared common with Y2 & Y3. Function: Brake or general purpose programmable
Y2	Optical darlington, 30V, 100mA max, NPN/sinking, shared common with Y1 & Y3. Function: Motion, tach or general purpose programmable
Y3	Optical darlington, 30V, 100mA max, NPN/sinking, shared common with Y1 & Y2. Function: Fault or general purpose programmable

Analog Inputs

STAC6 technical specs (cont)

Software selectable: 0-5V, ±5V, 0-10V, ±10V
RESOLUTION 12 bits (with ±10V signal range)
11 bits (with 0-10V or ±5V signal range)
10 bits (with 0-5V signal range)

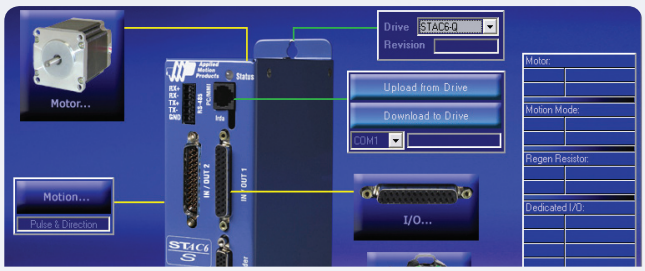
IN / OUT 2 connector - SE, QE and Si

8 digital Inputs
IN1-IN6 Optically isolated, 12 - 24V. Function. Function; general Purpose Input.
IN7/IN8 Optically isolated, differential. 12 - 24V. Function; general Purpose Input.

4 DigitalOutputs
OUT 1-4 Optical darlington, 30V, 100mA max, sinking or sourcing. Function: general purpose programmable

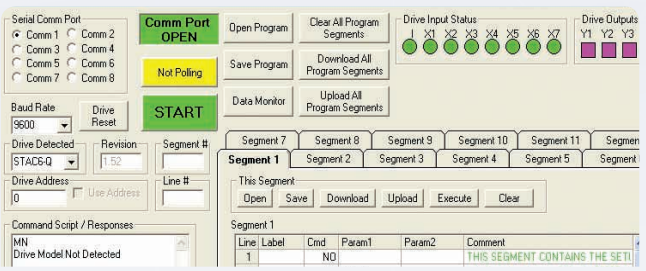
1 Analog Input
0-5VDC analog input - for use with Q or SCL software only

Software



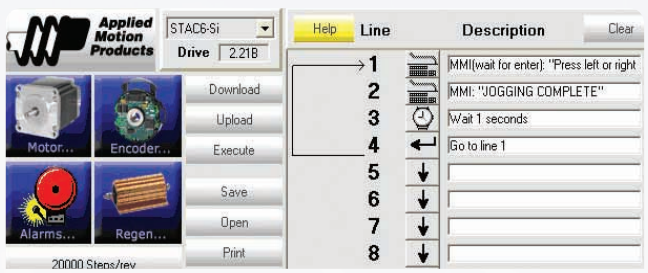
ST Configurator™

Used for setup, configuration, uploading and downloading programs to the STAC6. For more information about the *ST Configurator™* visit the STAC6 webpage: applied-motion.com/STAC6



Q Programmer™

Q Programmer™ is used to create and edit stand-alone programs for Q-compatible drives. The functions of these drives include multi-tasking, math, register manipulation, encoder following, and more.



Si Programmer™

Intended for use in stand-alone applications, *Si Programmer™* provides a friendly, point-and-click, graphical interface that doesn't require any previous programming experience.



Help Manuals - "Printable Pages"

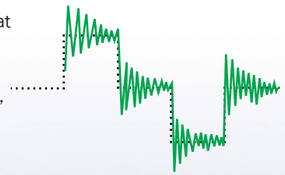
ST Configurator™ incorporates new help menus. All the technical data, application information and advice on setting up the drive is now just a mouse click away.

Runs on IBM-compatible PC's running Windows 7, XP, Vista, 2000, NT, ME, 98.

Features

Anti Resonance

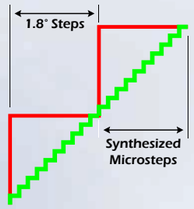
Step motor systems have a natural tendency to resonate at certain speeds. The STAC6 drives automatically calculate the system's natural frequency and apply damping to the control algorithm. This greatly improves midrange stability, allows higher speeds and greater torque utilization, and also improves settling times.



Delivers better motor performance and higher speeds

Micro Step Emulation

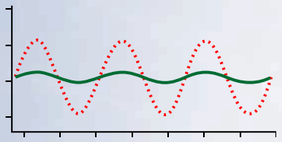
With Microstep Emulation, low resolution systems can still provide smooth motion. The drive can take low-resolution step pulses and create fine resolution micro-step motion.



Allows the use of PLC type pulse trains

Torque Ripple Smoothing

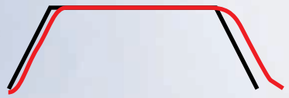
All step motors have an inherent low speed torque ripple that can affect the motion of the motor. By analyzing this torque ripple the system can apply a negative harmonic to negate this effect, which gives the motor much smoother motion at low speed.



Smooth, even motion from a stepper system

Command Signal Smoothing

Command Signal smoothing can soften the effect of immediate changes in velocity and direction, making the motion of the motor less jerky. An added advantage is that it can reduce the wear on mechanical components.



Assures smooth acceleration/deceleration ramps

Self Test & Auto Setup

At start-up the drive measures motor parameters, including the resistance and inductance, then uses this information to optimize the system performance. The drive can also detect open and short circuits.

Inputs & Outputs

S	Q	Si	C
7 digital inputs 3 digital outputs 2 analog inputs	7 digital inputs 3 digital outputs 2 analog inputs	15 digital inputs 7 digital outputs	7 digital inputs 3 digital outputs 2 analog inputs

CANopen®

Power Ratings

	STAC6	STAC6-220
Input Voltage:	94-135 VAC	94-265 VAC
Output Current:	6.0A Peak	3.2A Peak

For more information go to www.applied-motion.com/STAC6

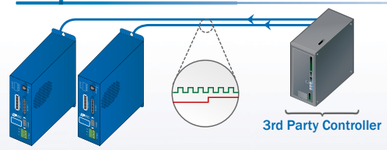


Q over CANopen

The STAC6 drive with the CANopen option board has the unique ability to access, modify and trigger a program stored on the drive.
The user develops and downloads a program using the Q programmer™ software. The program sequences can then be triggered via the CANopen network, creating a powerful distributed motion control system.

Control Options

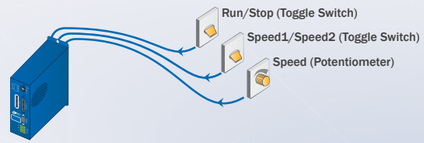
Step & Direction



S Q Si

- Step & Direction
- CW & CCW Pulse
- A/B Quadrature

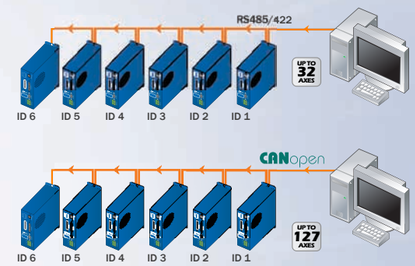
Oscillator / Run-Stop



S Q Si

- Software Configuration
- Two Speeds
- Vary speed with analog input
- Joystick Compatible

Host Control



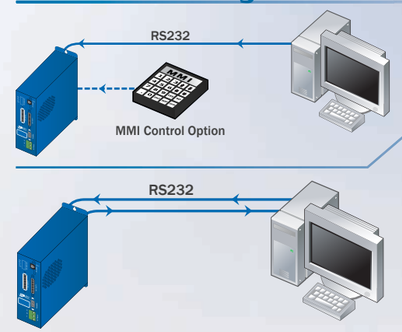
S Q

- Accepts Host Commands from PC or PLC
- Multi-axis Capable
- Real Time Control

C

- Connect to CANopen network
- DS301 and DSP402 protocols

Stand Alone Programmable



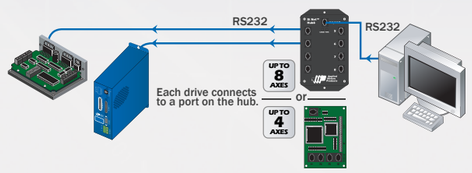
Si

- Point & Click Graphical Interface
- Download, store & execute programs
- MMI Option

Q

- Comprehensive text based language
- Download, store & execute programs
- High Level Features
  -Multi Tasking
  -Conditional Programming
  -Math Functions
- Host interface while executing internal programs

Multi axis Systems

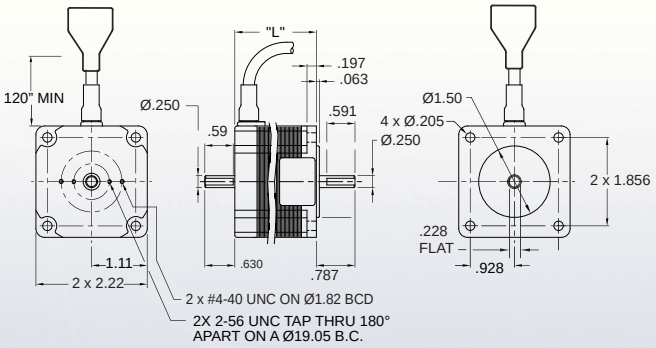


S Q Si

Use *SiNet Hub Programmer* software to develop your sequence of events, then download them to the hub for a stand-alone system **or** send serial commands to the drives from a PC, PLC, HMI, or other host controller.

STAC6 NEMA 23 Motors



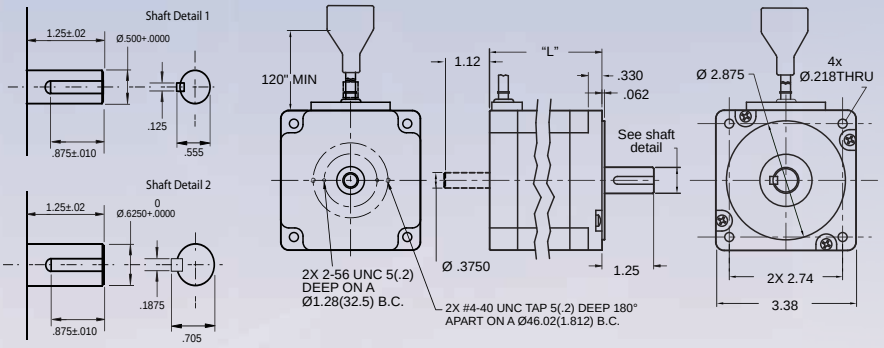


MOTOR PART NO.	STAC6 (120)		STAC6-220		HOLDING TORQUE oz-in	ROTOR INERTIA oz-in-sec²	MOTOR LENGTH inch (mm)
	Connection	Drive Current Setting amps/phase	Connection	Drive Current Setting amps/phase			
HT23-552	parallel	1.50	series	0.75	84.4	1.70E-03	1.71 (43.5)
HT23-553	parallel	1.50	series	0.75	167	4.25E-03	2.17 (55)
HT23-554	parallel	1.80	series	0.90	255	6.80E-03	3.05 (77.5)

Notes -
1) Drawing shown with optional rear shaft.
2) Encoder holes only on dual shaft version.
3) The "Drive Current Setting" shown here differs from the rated current of each motor because the rated current is RMS and the drive current setting is peak sine.
4) These motors include a 10ft cable.

STAC6 NEMA 34 Motors



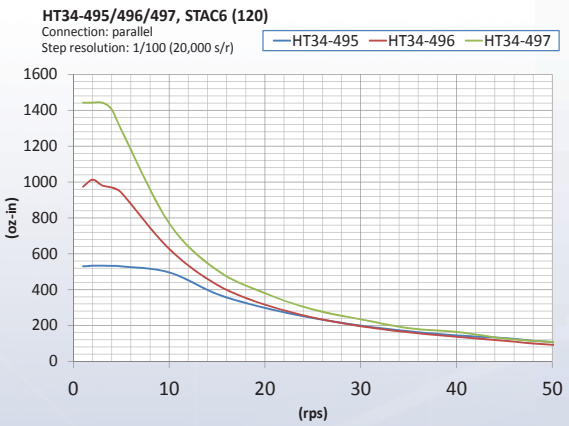


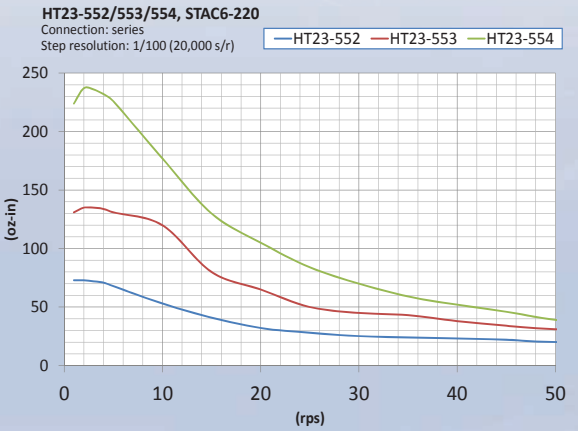
MOTOR PART NO.	STAC6 (120)		STAC6-220		HOLDING TORQUE oz-in	ROTOR INERTIA oz-in-sec²	MOTOR LENGTH inch (mm)	FRONT SHAFT DIAMETER inch (mm)
	Connection	Drive Current Setting amps/phase	Connection	Drive Current Setting amps/phase				
HT34-495	parallel	5.10	series	2.55	555	2.27E-02	3.11 (79)	0.5 (12.7)
HT34-496	parallel	5.10	series	2.55	1110	4.53E-02	4.63 (117.5)	0.5 (12.7)
HT34-497	parallel	5.80	series	3.20	1694	6.80E-02	6.14 (156)	0.625 (15.875)

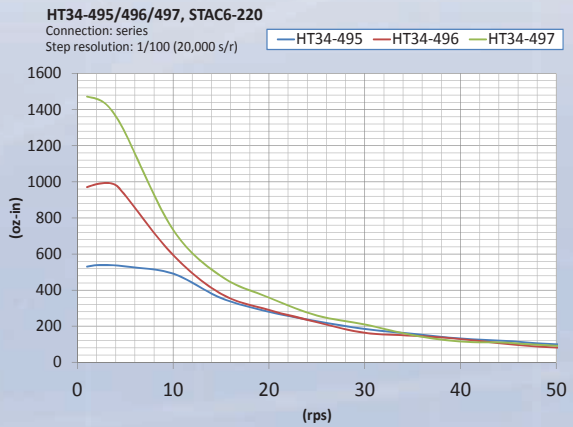
Notes -
1) Drawing shown with optional rear shaft.
2) Encoder holes only on dual shaft version.
3) The "Drive Current Setting" shown here differs from the rated current of each motor because the rated current is RMS and the drive current setting is peak sine.
4) These motors include a 10ft cable.

STAC6 -TORQUE CURVES









Option - Encoder

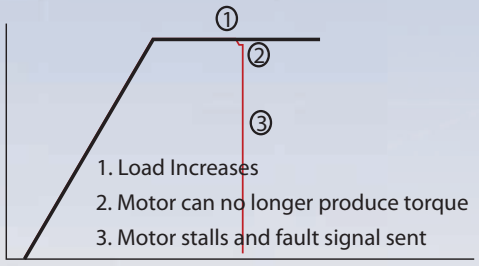
With the addition of an encoder on the motor the STAC6 can provide additional functions:

- **Stall Detection**: If an external force or increased load is placed on the system, the motor will reach a point at which it can no longer produce sufficient torque. At this point the motor will stall and stop rotating – a basic step motor system will not know this has happened and will assume the move has been completed. With the addition of an encoder on the motor the STAC6 can detect this stall and generate a fault signal which can be sent to an output, or used within the Q or Si program to branch to a fault handling routine.

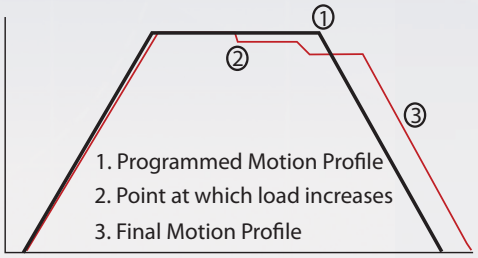
- **Stall Prevention**: If at some point during a motor's pre-programmed move the load on the system increases, the drive will detect that the lead angle of the motor is lagging. This may otherwise cause the motor to stall due to the lack of available torque.
The Stall Prevention feature of the drive reduces the motor's velocity (step motors have more torque at lower speeds) so that it can continue with the move. In this way the correct move distance is achieved, though the move has taken longer than programmed.

- **Position Maintenance**: When a motor is at zero speed holding position, it is possible for external forces to move the load out of position. With an encoder and position maintenance, this position error will be detected and the motor moved back to its correct position once the external force is removed.

Stall Detection



Stall Prevention



Other Products

Stepper Drives & Motors

Stepper drives are offered in both open frame (DC input) and packaged versions (AC input), in full/half step and microstepping versions.



Stepper Drives: http://www.applied-motion.com/products/stepper-drives
Stepper Motors: http://www.applied-motion.com/products/stepper-motors
Integrated Steppers: http://www.applied-motion.com/products/integrated-steppers

Servo Drives & Motors

Servo motors and drives from 50W to 1000W offered in AC and DC powered versions with options for host communication or Stand-alone control.



Servo Drives: http://www.applied-motion.com/products/servo-drives
Servo Motors: http://www.applied-motion.com/products/servo-motors

Gearheads

Applied Motion offers a full range of planetary gearheads to compliment the offering of servo motors and step motors.



http://www.applied-motion.com/products/gearheads/

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